Available online at www.sciencedirect.com

ScienceDirect

Lingua 164 (2015) 1–24

Lingua

www.elsevier.com/locate/lingua

Theme vowels in North Sámi: Spanning and maximal expression

Marit Julien *

Lund University, Centre for Languages and Literature, P.O. Box 188, SE-221 00 Lund, Sweden

Received 27 October 2014; received in revised form 4 June 2015; accepted 15 June 2015
Available online 19 July 2015

Abstract

In North Sámi, certain verbal derivations can be expressed as a change of theme vowel. An investigation of these derivations leads to the conclusion that spanning, i.e. one vocabulary item spelling out two or more terminal nodes, should be included in the toolbox of Distributed Morphology. It follows that competition between vocabulary items is resolved according to the Principle of Maximal Expression, which states that when two or more vocabulary items meet the conditions for insertion, the item leaving the smallest number of features in the terminal sequence unexpressed must apply. I also argue that some vocabulary items of North Sámi must make reference to the phonological context, in addition to being specified for the morphosyntactic feature content at the insertion site. This is how conjugation classes arise in the language. In other words, conjugation class membership does not depend on the root in North Sámi.

Keywords: North Sámi; Theme vowel; Inceptive; Semelfactive; Spanning; Vocabulary items

1. Introduction

Like the other Sámi languages, North Sámi is quite rich in morphology. All nominal words (nouns, pronouns and adjectives) are inflected for case and number, while verbs are inflected for person, number, tense and mood. In addition, there is a huge inventory of derivational categories, which form nouns, verbs, adjectives and adverbs from roots and stems of various types.

In this paper, I will focus on the verbal derivational types shown in (1)–(3). We have here pairs of North Sámi verbs, where both members of each pair are built from the same root but have different semantics. In (1), the verbs to the left denote states or processes, while the verbs to the right are inceptive verbs, denoting the beginning of the state or process.[1] In (2), the verbs to the left get a continuative reading, while the verbs to the right are

* Tel.: +46 702520406.
E-mail address: Marit.Julien@nordlund.lu.se.

[1] In North Sámi, verbs like *ballát* 'begin to fear', shown in (1a), which denote the beginning of a state, are different from inchoative verbs like *vuodjut* 'sink' and *rahpasit* 'open'. I therefore follow Smith (1991:77) and use the term *inceptive* for beginnings of states as well as for beginnings of events.

http://dx.doi.org/10.1016/j.lingua.2015.06.005

the corresponding semelfactives, and in (3), the verbs to the left are active verbs while those to the right are passives.[2,3]

(1) a. *ballat* 'fear' – *ballát* 'begin to fear'
b. *buollat* 'burn (intr)' – *buollát* 'begin to burn'
c. *duoldat* 'boil (intr)' – *duldet* 'begin to boil'
d. *čierrut* 'cry' – *čirrot* 'begin to cry'

(2) a. *čavgat* 'tighten, stretch' – *čavget* 'tighten, stretch, once'
b. *leabbut* 'spread out' – *lebbet* 'spread out once'
c. *njuikut* 'jump several times' – *njuiket* 'jump once'

(3) a. *borrat* 'eat' – *borrot* 'be eaten'
b. *čállit* 'write' – *čállot* 'be written'
c. *goarrut* 'sew' – *gorrot* 'be sewn'

We see that the verbs in each pair are formally differentiated by having different vowels in the second syllable, i.e. different *theme vowels*.[4] These three categories – inceptive, semelfactive and passive – are the only derivational categories in North Sámi that can have change of theme vowel as their only morphological manifestation. The question is then what is the connection between the formal difference and the difference in interpretation.

In order to give a satisfactory answer to this question, it is necessary to first have a proper understanding of the nature of the theme vowels and also of the syntactic structures underlying the alternations shown in (1)–(3). Hence, in this paper I will discuss theme vowels from a more general point of view before I turn to the three verbal derivational types.

My analysis is formulated within the model known as Distributed Morphology. Distributed Morphology, or DM for short, is a syntax-based approach to word structure which has become quite influential over the years. It was introduced in Halle and Marantz (1993, 1994), and has later been further developed and refined in a number of works by several authors, such as e.g. McGinnis (1995), Halle (1997), Marantz (1997), Noyer (1998), Harley and Noyer (2000), Embick and Noyer (2007) and Embick (2010). However, considerations of the behaviour of North Sámi theme vowels leads me to depart from the standard DM-view when it comes to the details of vocabulary insertion. On the standard DM-view, a morpheme in the overt realisation (called *vocabulary item*) corresponds to one terminal node in the underlying syntactic representation. I conclude instead, following Svenonius (2012) and Merchant (2015), that one morpheme in the word form can correspond to several nodes in the underlying structure – a phenomenon referred to as *spanning*.

Introducing spanning as a possibility in vocabulary insertion also requires that the principle that regulates the competition between vocabulary items must be reformulated. Instead of considering only the number of features spelled out by individual vocabulary items, such that an item that matches more of the features that are present at the insertion site will beat items that match fewer features, it also becomes necessary to take into account features and nodes that will not be phonologically represented if a particular vocabulary item is chosen. More precisely, a vocabulary item will win the competition for insertion if leaves fewer nodes and features unexpressed than its competitors. In other words, maximal expression of the features present in the syntactic structure is decisive.

Another conclusion is that the conjugation class membership of a given verb cannot depend on the root. It is instead a consequence of the properties of the vocabulary items that spell out inflection. Moreover, some of these vocabulary items must be conditioned by the phonological context, in addition to being specified for the morphosyntactic feature content at the insertion site.

The paper is organised as follows. In section 2, I give a brief sketch of the Distributed Morphology (DM) framework, and I also address the status of roots within this framework. In section 3, I turn to the analysis of theme vowels in North Sámi,

[2] The letter <á> represents a vowel that is longer and in some dialects also more fronted than the vowel represented as <a> (see Bals et al., 2005). In phonological transcription, I represent <á> as /a/ and <a> as /ɑ/. The letter <č> represents the affricate /tʃ/.

The alternation *uo* ∼ *u* in the first syllable in (1c), as well as the alternation *ie* ∼ *i* in (1d), is due to a regular phonological rule in North Sámi whereby an unstressed /e/ or /o/ in the second syllable triggers monophthongisation in the first syllable (see Sammallahti, 1998:42).

[3] In addition to building on my own (non-native) knowledge of North Sámi, data for this paper have been collected from Kåven et al. (1995), Nickel (1990), and Nielsen (1926, 1932–1962), as well as from Sammallahti (2002), which, among other things, contains a very useful backwards dictionary. The forms given here and elsewhere in the paper are those found in the standard written language.

[4] In the literature on Sámi, the vowel in the second syllable of a prosodic foot is traditionally referred to as *latus* (see e.g. Sammallahti, 1998:39). But since my concern here is certain morphologically and syntactically conditioned alternations seen in these vowels, I will use the morphological term *theme vowel*.

starting with verbs and nouns that are built on the same root but have different theme vowels. I conclude that the theme vowels here represent the verbalising and the nominalising heads.

In section 4, I present and discuss the three verbal derivational categories that can manifest themselves as a change of theme vowel. For the inceptive and the semelfactive, I suggest that the change of theme vowel is due to spanning, while for passive, I argue that the phonological realisation of the verbalising head is in certain cases altered by a readjustment rule.

In section 5, I address the fact that the derived verbs discussed in section 4 do not belong to the same conjugation class as their respective base verbs. Since a full description of the verbal inflection in North Sámi would take us far beyond the scope of the present paper, I focus on one marker from each conjugation, in order to show how the competition between the two markers arises and how it is solved. It turns out that the phonological environment is sometimes decisive, and we will also see that the Principle of Maximal Expression plays a role in vocabulary insertion, as already mentioned.

In section 6, I look at the interaction between the verbal derivational types that were discussed in section 4. It turns out that for semantic reasons, the semelfactive and the inceptive cannot be combined, and the same holds for the inceptive and the passive. The semelfactive can be passivised, but as a consequence of the form of the semelfactive, it involves no change of theme vowel. Hence, it turns out that a given verb can have its theme vowel altered by derivational categories only once.

Finally, I summarise my findings in section 7.

2. Distributed Morphology

As mentioned in the introduction, my analysis of North Sámi words will be based on the approach to word formation known as Distributed Morphology. Below, I give a brief sketch of the central features of the DM model in section 2.1. Then in section 2.2, I summarise the debate that has been going on within that framework concerning the status of roots, in order to motivate my treatment of roots in the sections that follow.

2.1. The basics of Distributed Morphology

Distributed Morphology takes syntactic structure to be built from abstract morphemes, consisting of morphosyntactic and semantic features only. These abstract morphemes are related to phonological features when the syntactic representation is handed over to spell-out, where so-called *vocabulary items*, some corresponding to roots and others corresponding to (bundles of) functional features, are inserted in the syntactic terminal nodes.

The vocabulary items contribute nothing but phonological features, but they are sensitive to the feature content of the node where they are to be inserted. For example, the English past tense marker /d/ is specified as an exponent of a Tense head with the feature [PAST], as shown in (4):

(4) T[PAST] ↔ /d/

Hence, the /d/ is in principle insertable in every node that meets the relevant specification. However, some English verbs do not take the /d/ as their past tense marker, but instead, for example, /t/ or the zero exponence Ø. Embick and Halle (2005) propose that the vocabulary entries for these items make specific reference to lists of verbs, as illustrated in (5):

(5) a. T[PAST] ↔ /t/ /{LEAVE, BEND, BUY, . . .} ___
b. T[PAST] ↔ Ø /{HIT, SING, SIT, . . .} ___

The criterion for inserting a vocabulary item in a given terminal node is that its features are non-distinct from the features of that node. In Halle and Marantz (1993:121) this is formulated as follows:

(6) *Vocabulary Insertion* (Halle and Marantz, 1993:121)
The phonological exponent of a Vocabulary Item is inserted into a morpheme of the terminal string if the item matches all or only a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary Item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features in the terminal morpheme must apply.

The requirement that the vocabulary item cannot be specified for features not present at the insertion site, while it need not be specified for all the features present there, is known as the Subset Principle. A consequence of this principle is that the items in (5) will beat the item in (4) whenever the conditions given in (5) are met.

In some cases, one vocabulary item spells out features originating in two terminal nodes. This is analysed as a result of fusion, a process whereby two terminal nodes are fused into one, so that only one vocabulary item can be inserted in the resulting terminal node. This vocabulary item can then match features from both original nodes (see e.g. Halle and Marantz, 1993:116). In other words, fusion makes it possible for portmanteau morphemes to appear.

In this paper, I propose that vocabulary items do not spell out two or more terminal nodes as a result of fusion, but instead, it is possible for one vocabulary item to spell out two or more terminal nodes that have not been fused. This is called spanning. The principles governing vocabulary insertion must then be slightly reformulated. But, importantly, I take the competition between vocabulary items to be strictly local, which means that only features that are present in the context of a given terminal node or sequence of nodes will be relevant for vocabulary insertion in that position. There is no global comparison at the level of the phrase or sentence (Embick and Marantz, 2008).

Another mechanism postulated within DM and assumed to influence the surface realisation is *readjustment*. Embick and Halle (2005) define readjustment rules as phonological rules that effect changes in a given morphosyntactic context, that is, after vocabulary insertion has taken place. As an example, they give the rule that changes the root vowel of *sing* to /æ/ in the past tense, formulated as in (7).

(7) /I/ → /æ/ /X ___Y [PAST],
X= √SING, √RING, √SINK, √BEGIN, √SIT, . . .

We see here that the rule makes reference to the feature [PAST] in the context, as well as to a list of vocabulary items that are susceptible to the rule. Moreover, it induces the change by brute force, which means that readjustment is a very powerful mechanism, and that appeal to it should only be made when there is no other possibility.

The output of the derivation will be evaluated against the *encyclopaedia*, the repository for meanings that are not given by the feature makeup of the nodes that entered into the derivation. That is, all non-compositional meanings are assigned here. Since the encyclopaedia is consulted after the derivation is completed, the syntactic context can be taken into consideration. Hence, it is the encyclopaedia that specifies that *pass* means 'hand over' in the context *pass the salt* and that the collocation *kick the bucket* means 'die'.

A built-in assumption in the Distributed Morphology model is that words that are semantically complex – that is, which involve more than one component of meaning – must also be syntactically complex, since each meaning component must correspond to a terminal node in the syntax. However, each terminal node in the syntax does not necessarily correspond to an element of the morphological form, since terminal nodes may be realised phonologically as zero (see e.g. Halle and Marantz, 1994:280). In addition, spanning means that one element of the morphological form can correspond to more than one terminal node in the syntax. Thus, there are exceptions in both directions to the one-to-one correspondence between syntactic terminal nodes and elements of the morphological form. In such cases, the semantic content of the word form is a more reliable clue to the underlying syntactic structure than its morphological form.

2.2. Roots in Distributed Morphology

The specification of roots has been a matter of debate within the DM framework. It is generally assumed that roots never appear bare in the syntax; they must combine with a functional head that specifies the category of the structure based on the root, i.e. with a v, n or a head (see e.g. Marantz, 1997; Embick and Marantz, 2008; Harley, 2009).[5] Marantz (1995) claimed further that the roots themselves are not individuated in the syntactic derivation. They are drastically underspecified, appearing only with features that are relevant to the syntactic computation, such as [±COUNT] or [±ANIMATE]. The consequence is that any root vocabulary item consistent with these features can be inserted in a given root node at vocabulary insertion. In other words, it is entirely up to the speaker whether a given root terminal node will be realised as *cat* or *dog*.

The view that roots are not distinguished in the syntax can only be upheld if there is no root suppletion. If, for example, the alternation between the forms *go* and *wen* in the paradigm of the English verb *go* is an alternation of root forms, then *wen* will have to be specified as [PAST]. As a consequence, in the context of [PAST], the vocabulary item *wen* will always win over less specified vocabulary items, such as e.g. *play* or *cry*. The solution provided in Marantz (1995) is that the English verb *go* is a functional element, more specifically a light verb, and that other apparent cases of root suppletion also in reality involve functional elements.

Harley (2014) argues, however, that root suppletion does indeed exist. Consequently, roots must be identified in the syntax. But crucially, to make suppletion possible, they cannot be associated with any particular phonological realisation.

[5] Borer (2003) put forward a similar proposal, although within a different framework.

In addition, some roots show so much semantic variation that one cannot assume that they are semantically identified either. This means that in the syntactic computation, roots are identified as purely abstract entities, which will be paired with phonological features at the interface of syntax and phonology. Harley concludes that the meaning of roots is finally determined in the encyclopaedia.

In the present context, the question of whether roots are individuated throughout the syntactic derivation need not be given a conclusive answer. What matters is that the identity of the root is known when the next head, i.e. the v, n or a, is spelled out, since the realisation of these heads is conditioned by the root in North Sámi. If vocabulary insertion proceeds from the inside out (Halle and Marantz, 1993; Bobaljik, 2000), then the identity of the root will always be known at the point where the categorical head is spelled out. Hence, in the following I will treat the roots as if their identity is known at vocabulary insertion – an assumption that is also implied by the vocabulary items given in (5).

3. North Sámi theme vowels across word classes

In North Sámi, verbs, nouns and adjectives, i.e. words belonging to the open lexical categories, do not appear as bare roots. They always involve at least a theme vowel in addition to the root. A few examples were shown already in (1)–(3), but in this section, I give some further examples of how theme vowels behave. More specifically, I show how nouns and verbs formed from the same root can be distinguished by their theme vowels.

In (8) we have some pairs of verbs and nouns sharing the same root, but whereas the verbs have the theme vowels /i/, /ɑ/ (written <a>) or /u/, the theme vowel is invariably /u/ in the corresponding nouns. Also note that the root syllable always has a consonantal coda.

(8)	Verb		Noun
a.	*atnit* ‘use’	–	*atnu* ‘use’
b.	*diehtit* ‘know’	–	*diehtu* ‘knowledge’
c.	*johtit* ‘travel’	–	*johtu* ‘movement’
d.	*ballat* ‘fear’	–	*ballu* ‘fear’
e.	*bargat* ‘work’	–	*bargu* ‘work’
f.	*doaivut* ‘hope’	–	*doaivu* ‘hope’

Notably, the theme vowels of disyllabic verbs like those shown in (8) are subject to change in some inflectional forms, as we will see in section 5. However, I take the vowel seen in the infinitive to be the underlying realisation of v, so that the formation of the infinitive only involves adding the infinitival marker *-t.*

The verbs and nouns in (9) are pairwise related in the same way as those in (8). We also see that the verbs here have one of the theme vowels /ɑ/, /e/, or /o/, while the nouns all have the theme vowel /ɑ/.

(9)	Verb		Noun
a.	*jurrat* ‘make a noise, hum’	–	*jurra* ‘noise, hum’
b.	*skeŋket* ‘present’	–	*skeaŋka* ‘gift’
c.	*murret* ‘chop wood’	–	*muorra* ‘wood’
d.	*dulkot* ‘interpret’	–	*dulka* ‘interpreter’

It is however clear that neither /u/ nor /ɑ/ in themselves can be characterised as markers of deverbal nominalisation.[6] There are many nouns in the language that have these theme vowels without being semantically or morphologically related to verbs. Some examples with /u/ are given in (10) while some nouns with /ɑ/ are seen in (11).

(10)		
	dállu ‘house, farm’	*rivgu* ‘non-Sámi woman’
	girku ‘church’	*siellu* ‘soul’
	mánnu ‘moon; month’	*vahkku* ‘week’

[6] Although the pattern shown in (8) has a relative high type frequency, not all North Sámi verbs have corresponding nouns consisting of just the root and a theme vowel. All verbs do however allow nominalisation by means of the so-called *aktio*, which is marked by a suffixed *-n* following the theme vowel. Two examples are given in (i) (I thank Hanna Outakoski for help on this point):

(i) a. *dadjat* ‘say’ **dadja*, **dadju*, *dadjan* ‘saying’
b. *viehkat* ‘run’ **viehka*, **viehku*, *viehkan* ‘running’

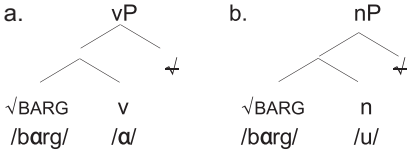
(11) *árba* ‘scar’ *giella* ‘language’
čakča ‘autumn’ *juvla* ‘wheel’
earta ‘pea’ *viellja* ‘brother’

In Halle and Marantz (1993) theme vowels were taken to be indicators of conjugation class, added after syntax to meet well-formedness conditions (Spanish, Russian, Latin and Latvian were the languages mentioned). A related proposal was put forward by Oltra Massuet (1999). Oltra Massuet argued, on the basis of Catalan, that the theme vowels are not exponents of v heads, since a v head can be realised e.g. as a causative suffix, which then will be followed by a theme vowel. She proposed instead that theme vowels are the phonological realisations of nodes that are added, in the morphology, to v as well as to other functional heads. In Embick and Halle (2005) a similar idea is formulated as the claim that theme vowels are exponents of nodes that are merged above v at PF.

Although the theme vowel of a verb is an indicator of conjugation class also in North Sámi, the choice of theme vowel in addition determines, for each individual root, whether it will show up as a verb or as a noun. Moreover, even causative verbalisers can be spelled out as theme vowels, as in *cuovkut* ‘break (trans.)’, which is based on the same root as the adjective *cuovkkas* ‘broken’, while in other cases, the causative follows the theme vowel of the base verb, as in *vuodjudit* ‘sink (trans.)’, from *vuodjut* ‘sink (intr.)’. In a DM-based approach, the observed patterning of theme vowels can be explained if we assume that roots have no category, and that the lexical categories noun and verb result from combining a categoryless root with functional projections of a nominal and verbal nature, respectively, as in e.g. Marantz (1997). The theme vowels in words like those shown above can then be analysed as realisations of n and v heads. Notably, Pylkkänen (2002:94) draws the same conclusion for Finnish on the basis of the observation that the final vowel in Finnish verbs and nouns varies with the category, as in *katse* ‘look$_N$’ and *katso* ‘look$_V$’.

For North Sámi, this means, for example, that the verb *bargat* ‘work’ (see (8e)) involves the structure shown in (12a), while the noun *bargu* ‘work’ involves the structure in (12b). In the verbal projection in (12a) a v head is merged over the root, while in the nominal projection in (12b) an n head is merged over the root. In each case, the root undergoes head movement to the categorical head, so that the phonological realisation of that head, i.e. the theme vowel, ends up suffixed to the root.

(12) a. b.



If these are the right structures, it follows that neither the verb nor the noun is derived from the other. On this point, my analysis then goes against the descriptive grammars of North Sámi, such as Nielsen (1926) and Nickel (1990), where nouns like those in (8) are taken to be derived from the corresponding verbs.

Also note in (12a) that I have left out the external argument and the head that introduces it. That is, I adopt the idea, going back to Pylkkänen (2002), that the external argument is introduced by a head that is distinct from v. This is a necessary assumption if the complement of v is a categoryless root phrase, so that all verbs involve a v head. Since not all verbs have external arguments, v is not likely to be the introducer of the external argument, unless we postulate that there are v elements of different types, some of which introduce an external argument while others do not. Other arguments in favour of the separation of v and the head that introduces the external argument are given by Alexiadou et al. (2006) and Harley (2009, 2013).

I now take verbs and nouns that do not directly correspond to a member of any other lexical class to also involve the structures shown in (12). However, since each theme vowel only appears with certain roots, variation in theme vowels must be seen as a case of root-conditioned allomorphy. This means that the vocabulary entry for each theme vowel must specify which roots it can combine with to form verbs and nouns, respectively, possibly in a similar fashion to the specifications proposed by Embick and Halle (2005) for allomorphs of the past tense marker in English, shown in (5). I exemplify this in (13) with the vocabulary entries for the nominal theme vowels /u/ and /ɑ/ (cf. the nouns given in (8)–(11)):

(13) a. n ↔ /u/ /{√ATN, √BALL, √DIEHT, √GIRK, √MÁNN . . .} ___
b. n ↔ /ɑ/ /{√JURR, √SKEAŋK, √MUORR, √ÁRB, √ČAKČ . . .} ___

Whether the result of combining a root with an n will be interpreted as a pure action nominal, or instead get e.g. a more concrete interpretation, need not be specified in the vocabulary nor be signalled in any way in the syntactic structure.

Instead, this is where the encyclopaedia comes into play. It contains information about the interpretation of a given root in verbal and nominal environments; for example, that the nominal *bargu* 'work' can denote an activity or a state of being employed, and that the nominal *dulka*, related to the verb *dulkot* 'interpret', means 'interpreter' and not 'interpretation' (see (9d)).

Before we move on, it should be noted that verbalisers and nominalisers are not always realised as theme vowels. Many nouns in particular, such as *gahpir* 'hat', *rieban* 'fox' and *šibit* 'cattle', do not conform to the pattern described above. I have nevertheless focused here on verbs and nouns made up of a root and a theme vowel, since these are more relevant for our attempt to understand the nature of these vowels.

4. Verbs derived from verbs

While the verbs and corresponding nouns seen in section 3 will be ultimately distinguished by their inflection, there are cases in North Sámi where a change of theme vowel is the only signal that a word derivation has taken place. Some examples were shown already in (1)–(3). In this section, I will present my analysis of the three verbal derivational types where alternations in theme vowels may serve to distinguish one verb from another. The derivation of inceptives is addressed in section 4.1, semelfactive verbs and their continuative counterparts in section 4.2, and passive formation in section 4.3.

4.1. Inceptive verbs

In North Sámi, inceptive verbs, i.e. verbs that mark the beginning of an event, can be formed from stative verbs, as in (14), and from activity verbs, as in (15). And as we see, in each case shown here the principal formal difference between the inceptive verb and the base verb is the theme vowel.[7]

(14)	Stative verb		Inceptive verb
a.	*ballat* 'fear'	>	*ballát* 'begin to fear'
b.	*bivvat* 'keep warm'	>	*bivvát* 'get warm'
c.	*diehtit* 'know (that)'	>	*diehttát* 'get to know'
d.	*goallut* 'feel cold'	>	*goallát* 'begin to feel cold'
e.	*gohci* 'be awake'	>	*gohccát* 'wake up'
f.	*máhttit* 'know (how)'	>	*máhttát* 'learn, begin to know'

(15)	Activity verb		Inceptive verb
a.	*buollat* 'burn (intr.)'	>	*buollát* 'begin to burn'
b.	*johtit* 'travel'	>	*johttát* 'begin to travel'
c.	*vardit* 'bleed'	>	*vardát* 'begin to bleed'
d.	*čeagŋát* 'squat'	>	*čegŋet* 'squat'
e.	*duoldat* 'boil (intr.)'	>	*duldet* 'begin to boil'
f.	*čierrut* 'cry'	>	*čirrot* 'begin to cry'
g.	*orrut* 'stay'	>	*orrot* 'settle down'

In some inceptives formed from activity verbs we find instead the suffix *-iid* (pronounced /i:d/) as in the examples in (16) (the final *-it* is the allomorph of the infinitival ending that appears after consonants).

(16)	Activity verb		Inceptive verb
a.	*cahkat* 'smoulder'	>	*cahkiidit* 'catch fire'
b.	*goikat* 'dry (intr.)'	>	*goikkiidit* 'begin to dry'
c.	*golgat* 'float'	>	*golggiidit* 'begin to float'
d.	*čoaskut* 'cool (intr.)'	>	*čoskiidit* 'begin to cool'

[7] In addition, in some inceptive verbs the consonant centre of the root differs from that of the base verb, as in *diehttát* 'get to know', from *diehtit* 'know'. The alternation between *-htt-* and *-ht-* is an example of the so-called consonant gradation, which is a pervasive feature in the inflectional morphology of North Sámi. It affects consonants at the centre of a prosodic foot, i.e. the coda of the stressed syllable and the onset of the following syllable (see e.g. Sammallahti, 1998; Bals et al., 2005). I will not go into the details of consonant gradation here, but I assume, with Baal et al. (2012) that the gradation is the consequence of a floating mora connected to individual markers, which may or may not also have a segmental realisation (see also Svenonius, 2008).

Morphologically, the derivation of inceptives from stative verbs is more regular than the derivation of inceptives from activity verbs, since in the former the theme vowel is invariably /a/ (represented in the orthography by the letter <á>), whereas in the latter we find the theme vowels /a/, /e/ and /o/, as well as the suffix /i:d/.

The formation of morphological inceptives like those in (14)–(16) is however semantically restricted. It only applies to verbs that do not have external arguments in the strict sense, that is, that do not have subjects that are agents/causers. Since Kratzer (1996), agents/causers are often taken to be introduced by a Voice head (see e.g. Pylkkänen, 2002). It has also been argued that Voice is separate from causative and verbalising heads (Pylkkänen, 2002; Vinka, 2002; Alexiadou et al., 2006; Harley, 2013). The absence of agents/causers in North Sámi morphological inceptives then suggests that the complement of the inceptive does not include a Voice head. In Julien (2013), I propose that these inceptives are formed by adding an inceptive head on top of the minimal verb phrase headed by the base verb, and I refer to them as ''low inceptives''. I will adopt this analysis also here.

Verbs that have agentive subjects, in North Sámi, form inceptives by means of auxiliaries, such as *-goahtit* 'begin', shown in (17), or *álgit* 'begin', shown in (18). Note that *-goahtit* attracts the head of its complement and combines with it morphologically, but it does not alter the theme vowel. The complement of *-goahtit* can be passive, as in (19), and causative, as in (20), and, as shown in Julien (2013), the same holds for the complement of *álgit*.[8]

(17) *Čálli barga-gođii girjjiin máŋga jagi áigi.*
author work-begin.PAST.3SG book.COM many years ago
'The author started working on the book many years ago.'

(18) *Peter álggii bargat juovlamánus.*
Peter begin.PAST.3SG work.INF December.LOC
'Peter started to work in December.'

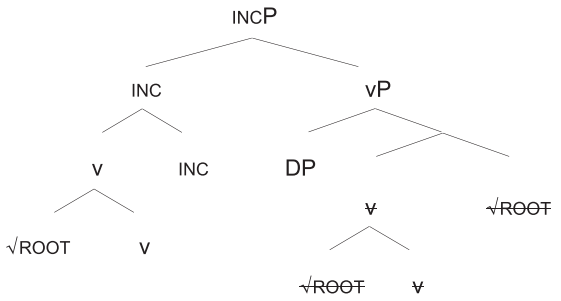
(19) *Klosterat hukse-juvvo-gohte 1500-logus.*
monastery.PL.NOM build-PASS-begin.PAST.3PL 1500-number.LOC
'The monasteries began to be built in the 16th century.'

(20) *Elle oahpa-hiš-gođii same-giela studeanttaide*
Elle learn-CAUS-begin.PAST.3SG Sámi-language.ACC student.PL.ILL
'Elle began to teach Sámi to the students.'

This means that inceptive auxiliaries are located much higher up in the clause than the low inceptives seen in (14)–(16), and for this reason, inceptives formed with auxiliaries are called ''high inceptives'' in Julien (2013).[9]

However, also in the low inceptive the semantics suggest that the base verb is present as the complement of the inceptive element. The fact that all low inceptives correspond to non-inceptive base verbs also points in the same direction. I take these inceptives to be formed by adding an inceptive aspectual head above the vP, so that their syntactic structure can be showed schematically as in (21).

(21)



[8] The examples in (17)–(20), as well as other examples in this paper, are edited versions of examples found in the Sámi corpus developed by Giellatekno, Centre for Saami language technology at the University of Tromsø. The corpus contains written North Sámi texts of various types, and the total size of the corpus is approximately 2.5 million words. See gtweb.uit.no/korp/.

[9] Julien (2013) provides a detailed discussion of the properties of the inceptive auxiliaries *-goahtit* 'begin' and *álgit* 'begin'.

As indicated here, the verb is formed by successive cyclic head movement of the root to the verbaliser, and of the root and verbaliser to the inceptive head. I also include the subject, which I take to be the specifier of v, while the infinitival marker and other derivational or inflectional markers, representing heads that originate higher up in the structure, are left out.

The question is now how the theme vowels of the inceptive verbs should be analysed. One possibility is that they are realisations of the inceptive head. Since the /a/ seen in (14) and in (15abc) is arguably the elsewhere allomorph of the low inceptive, while other realisations are sensitive to the root, the vocabulary entries given in (22) can then be formulated. For reasons that will be given below, I also include the marker /i:d/ here – that is, I see it as one suffix and not as a combination of theme vowel and inceptive marker.

(22) a. INC ↔ /e/ /{√ČEAGŋ,√DUOLD, . . .} ___
b. INC ↔ /o/ /{√ČIERR,√ORR, . . .} ___
c. INC ↔ /i:d/ /{√CAHK,√GOIK, . . .} ___
d. INC ↔ /a/

That inflectional markers can show root-conditioned allomorphy even in the absence of structural adjacency to the root has been at least implicitly assumed since the beginning of DM. This is reflected in the entries for the English past tense markers shown in (5). More recently, the possibility of having heads in the functional domain conditioned by the root has been formally expressed e.g. in Embick (2010), where linear adjacency is taken to be decisive. Notably, the English past tense markers as well as the North Sámi inceptive markers are linearly adjacent to the root, since intervening heads have no phonological realisation. The entries in (22) are also in accordance with the claim put forward in Embick (2013) that a non-cyclic head can see a root across a cyclic head. Embick takes the category-defining heads to be cyclic heads while tense heads are examples of non-cyclic heads. Inceptive aspectual heads are most likely also non-cyclic, and the inceptive markers should be able to make reference to the root, as in (22).

If the theme vowel of the low inceptives represents the inceptive head, one might want to propose that theme vowel of the base verb, the realisation of v, is deleted by a phonological rule that deletes the first vowel in a derived VV-sequence (see e.g. Casali, 1998).[10] There is however no evidence that a general vowel-deleting rule applies in North Sámi. Consider the examples in (23), where I show what happens when the accusative/genitive marker *-id* is added to nouns with various different theme vowels, and in (24), where I show how the adjectival derivational suffix *-i* applies to nouns and gives adjectives meaning 'rich in Noun':

(23)	NOM SG	ACC/GEN PL
a.	*nieida* 'daughter'	*nieiddaid*
b.	*bussá* 'cat'	*bussáid*
c.	*baste* 'spoon'	*basttiid*
d.	*márfi* 'sausage'	*márffiid*
e.	*reŋko* 'stool'	*reŋkkuid*
f.	*viessu* 'house'	*viesuid*

(24)	NOUN	ADJECTIVE
a.	*boallu* 'button'	*boallui* 'rich in buttons'
b.	*geađgi* 'stone'	*geađgái* 'stony, rich in stone'
c.	*vuodja* 'fat'	*vuoddjái* 'fatty, rich in fat'

In (23), some of the theme vowels undergo regular alternations, such as /e/ > /i/ in (23c) and /o/ > /u/ in (23d). In (24), the change of /i/ and /ɑ/ to /a/ must be encoded in the suffix *-i*, since it is not a regular phonological process in the language, as seen in (23). There are many inflectional and derivational elements that in a similar way alter the theme vowel of the base that it attaches to, but the only derivational categories that appear to trigger replacement of the theme vowel are the three verbal derivational types discussed in the present paper. Hence, there are no other comparable cases where vowel deletion could be postulated.

If we now go back to the inceptives in (16), where the root is followed by the sequence *-iid*, the patterns shown in (23) indicate that adding /id/ after the theme vowel does not give *-iid* as result. Adding a suffix /id/ after a vowel /ɑ/ or /u/ should instead give the sequences /ajd/ and /ujd/. I therefore conclude that also in the inceptives in (16) the theme vowel of the base verbs is replaced by the inceptive marker, which is /i:d/ in these cases. Thus, it appears to be a morphological fact

[10] Thanks to an anonymous *Lingua* reviewer for pointing out this to me.

that the theme vowel of the base verb disappears when an inceptive suffix is added. The question is then how the disappearance of the original theme vowel in inceptives should be accounted for in morphological terms.

One possibility is that the verbaliser is spelled out as zero in the context of the inceptive, in accordance with the vocabulary entry given in (25).

(25) v ↔ Ø / ___ [INC]

This vocabulary entry would then compete for insertion with the vocabulary entries that spell out v in the absence of the inceptive. If we take the theme vowel of the stative verb *ballat* 'fear' as an example, the theme vowel /ɑ/ has the vocabulary entry in (26a) or the vocabulary entry in (26b), depending on whether the stativity of the v has to be specified – a question that I will leave open here.[11]

(26) a. v_{STAT} ↔ /ɑ/ / {√BALL,√BIVV, . . .} ___
b. v ↔ /ɑ/ / {√BALL,√BIVV, . . .} ___

Corresponding entries can be formulated for the other theme vowels seen in the base verbs in (14)–(16). Note in particular that the root will have to be specified, since the choice of theme vowel depends on the root.

However, the vocabulary entries in (26) are both in conflict with the entry in (25). The entry in (26a) is more specified than (25), and consequently, it would win over (25) also in the context of the inceptive. The entry in (26b) is specified to the same degree as (25), and unless we stipulate, for example, that reference to higher nodes take precedence over reference to lower nodes, there is no way to resolve this conflict. I conclude that (25) is wrong.

One might instead propose that the vocabulary entries for the zero realisation of the theme vowel are specified as in (27).

(27) a. v ↔ Ø/ {√BALL,√BIVV,√BUOLL,√DUOLD,√GOIK, . . .}___ [INC]
b. v ↔ Ø / {√DIEHT,√GOHC,√VARD, . . .}___ [INC]
c. v ↔ Ø / {√GOALL,√ČIERR,√ORR,√ČOASK, . . .}___ [INC]

With a set of roots specified for each of the zero markers, these entries are more specified than vocabulary entries of the form exemplified in (26), which will ensure that the entries in (27) will win when an inceptive head is present. However, the fact that all three entries in (27) give v a zero realisation appears to be a coincidence, so that the generality of the disappearance of the theme vowel of the base verb in the corresponding inceptive is not captured.

Seeing the disappearance of the /ɑ/ as the consequence of the readjustment rule given in (28) might seem to be a better solution:

(28) V → Ø / X ___ [INC], X = v

Here V stands for any vowel, and the rule says that it is deleted if it represents a verbaliser and precedes a marker representing an inceptive head. The rule can be formulated as general as this, since all vowels representing the verbaliser disappear when they are adjacent to the inceptive. On this analysis, the verbaliser in a low inceptive is spelled out in the same way as in the corresponding base verb, and then deleted when (28) applies. There is then no need to postulate phonologically null elements that compete with theme vowels for insertion, which is a welcome consequence of the readjustment analysis.

However, readjustment rules are problematic in general, since it is not clear whether there are any principal restrictions on what they could do (cf. Bermúdez-Otero, 2012). Moreover, in the case at hand the proposed rule would be little more than a restatement of the facts. I will therefore consider another option, namely, that the stative verbaliser and the inceptive head are spelled out together by one single vocabulary item. On a traditional DM-analysis, this would mean that the two nodes are fused into one, so that the features of the two nodes can be spelled out jointly by one single vocabulary item. The concept of fusion is also deeply problematic, though, since it implies that the syntax can tailor the syntactic structure to fit the contents of the vocabulary. As an alternative to fusion one could instead assume that two or more nodes can be spelled out by one single vocabulary item, without any fusion operation preceding vocabulary insertion. The spelling out of two or more unfused heads by one single morphological exponent, i.e. one vocabulary item, is discussed in Son and Svenonius (2008), Svenonius (2012) and Merchant (2015) and

[11] The designation v_{STAT} corresponds to v_{BE} in Folli and Harley (2007), and it is also related to the stative little v proposed in Kratzer (1996).

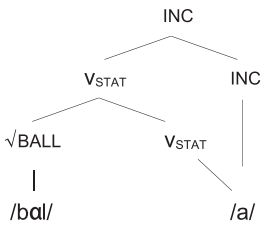
termed *spanning* (the term was originally introduced in Williams, 2003). Svenonius (2012) proposes that spanning is possible if the involved heads belong to the same functional sequence and are in a complement relation with each other. That is, a head can be spelled out together with the head of its complement, but not together with a head located inside its specifier.

The low inceptive in North Sámi should allow spanning of the verbaliser and the inceptive head, since successive cyclic head movement causes these two nodes to be adjacent to each other inside the same complex head, as shown in (21) above. I propose that the North Sámi vocabulary contains the entries shown in (29):

(29) a. <v, INC> ↔ /e/ / {√ČEAGŋ,√DUOLD, . . .} ___
b. <v, INC>↔ /o/ / {√ČIERR,√ORR, . . .} ___
c. <v, INC>↔ /i:d/ / {√CAHK,√GOIK, . . .} ___
d. <v, INC>↔ /a/

I further propose that the principle which says that a more specified vocabulary item is preferred over a less specified one, need not refer to a single terminal node only, but to the whole sequence of nodes that a given vocabulary item can spell out.[12] Now consider for example the inceptive *ballát* 'begin to fear', where the vocabulary entry in (26a) or (26b) competes with the entry in (29d) for insertion. Since the item in (29d) is morphosyntactically more specified than either of the entries in (26), (29d) wins when an inceptive head is present. The spellout of the complex head consisting of a root, a stative verbaliser and an inceptive head will then proceed as sketched in (30). As we see, the root is spelled out separately, whereas the stative verbaliser and the inceptive head are realised together by one single vocabulary item.

(30)



The morphological result of inserting a single marker /a/ spanning the two heads that follow the root in the linear order is that the verb gets what looks like an ordinary thematic vowel, located immediately after the root. However, unlike the thematic vowel in the base verb *ballat* 'fear', which spells out only the verbaliser, the thematic vowel in the inceptive *ballát* 'begin to fear' spells out the verbaliser plus an aspectual head. Hence, it is not the case that all North Sámi thematic vowels represent the same underlying syntactic structure.

Summing up, I think the phonological realisation of the North Sámi low inceptives cannot be accounted for satisfactorily only with reference to competing vocabulary items, each spelling out one and only one head. Some additional mechanism must be involved. I have suggested two alternative explanations, one based on readjustment rules and one based on spanning – one single vocabulary item spelling out two or more adjacent heads. Of these, I think the latter offers the simplest explanation of the facts. When we now turn to semelfactive verbs, we will encounter data which also speak in favour of the spanning analysis.

4.2. Semelfactive verbs

In the North Sámi inceptive verbs presented above, the direction of derivation could be established relatively easily – low inceptives are semantically more complex than the corresponding stative or activity verbs, and I take them to also be more complex structurally. In the verb pairs shown in (31), however, it is not obvious which verb, if any, is basic and which verb is derived. What we see here are pairs of continuative verbs and corresponding semelfactive verbs, where, in each pair, the two verbs are distinguished only by the theme vowel.[13]

[12] A revised version of the principle that resolves competition between vocabulary items will be presented in section 5.

[13] Again, we see that an /e/ in the second syllable triggers monophthongisation in the first syllable. This is however a general phonological process and not connected to particular morphemes (cf. fn. 2).

(31)	Continuative		Semelfactive
a.	*cirgut* 'spurt (repeatedly)'	–	*cirget* 'spurt once'
b.	*čavgat* 'tighten (repeatedly)'	–	*čavget* 'tighten once'
c.	*čuorvut* 'shout (repeatedly)'	–	*čurvet* 'shout once'
d.	*diškut* 'splash (repeatedly)'	–	*dišket* 'splash once'
e.	*leabbut* 'spread out (repeatedly)'	–	*lebbet* 'spread out once'
f.	*njuikut* 'jump (repeatedly)'	–	*njuiket* 'jump once'
g.	*ravgut* 'jerk, pull (repeatedly)'	–	*ravget* 'jerk, pull once'

As indicated in the translations in (31), semelfactive verbs denote a singular minimal event, whereas the corresponding continuative verbs denote a series of identical events. And as frequently noted in the linguistic literature, semelfactive verbs do not fit neatly into the very influential classification of lexical aspect proposed by Vendler (1957), where verbal predicates are claimed to fall into four aspectual classes: states, activities, accomplishments and achievements. Smith (1991) identifies semelfactives as a fifth class, characterised by being dynamic, punctual and atelic, which means, on her view, that they are similar to achievements except that they do not encode a result state – achievements being dynamic, punctual and telic in her analysis (see Smith, 1991:30).

In the linguistic literature, semelfactive verbs have mainly been discussed on the basis of English, where the semantic distinction between a semelfactive and a continuative reading is not reflected in the morphology. The verb *jump*, for example, could denote an event where a single jump occurs, or an event involving a series of jumps. Which reading, if any, is more basic can be determined only on semantic grounds, and then the problem is that the facts are not decisive. Rothstein (2004:186) says that an activity verb also has a semelfactive reading if it is ''associated with a natural atomic function which picks out its minimal elements''. But then the activity reading could be seen as basic, and the semelfactive reading, on which the verb represents a minimal event in the denotation of the activity verb, could be seen as the result of applying the function that picks out a minimal event. Alternatively, the semelfactive reading could be seen as basic, and the continuative reading as the result of summing several minimal events. Rothstein chooses the latter. In addition, she argues that semelfactives are telic, since they can be modified by time frame adverbials ('in x time').

The telicity of semelfactives is also an essential factor in the analysis presented in Ramchand (2008), although her conclusion is different from Rothstein's. Ramchand takes semelfactives to encode a result state, which, on her analysis, is not present on the continuative reading. This means that semelfactives are more complex syntactically than the corresponding continuative verbs.

In North Sámi, we can find cases where the morphology might be taken to suggest that semelfactives are indeed more complex than their continuative counterparts. In the verbs pairs in (32) the semelfactive verb is apparently formed by adding a *-d-* outside the theme vowel of the base verb (again, the final *-(i)t* in the citation forms is the infinitival marker).

(32)	Continuative		Semelfactive
a.	*čolgat* 'spit'	–	*čolgadit* 'spit once'
b.	*čorbmat* 'strike with the fist'	–	*čorbmadit* 'strike once with the fist'
c.	*čuolbmat* 'tie'	–	*čuolbmadit* 'tie once, tie one knot'
d.	*hoigat* 'knock, push'	–	*hoigadit* 'knock, push once'

However, the facts are not decisive. Since semelfactives involving a suffixed *-d-* are only formed from base verbs that have *-a-* as theme vowel, it is not entirely clear whether the semelfactive marker is *-d-* or *-ad-*. If it is *-ad-*, there is only one morpheme between the root and the infinitive in the semelfactive verbs as well as in their continuative counterparts.

In the pairs in (33), both members of each pair carry consonantal suffixes, so that one cannot claim that any of them is morphologically more basic than the other. In this respect, these pairs are similar to the pairs in (31).

(33)	Continuative		Semelfactive
a.	*cirgguhit* 'squirt (tr.) repeatedly'	–	*cirgalit* 'squirt (tr.) once'
b.	*ravkkuhit* 'wink (eye) repeatedly'	–	*ravkalit* 'wink (eye) once'
c.	*riškkuhit* 'splash (tr.) repeatedly'	–	*riškalit* 'splash (tr.) once'

Moreover, in the verb pairs shown in (34) it seems clear that the markers *-al-*, *-ast-* and *-est-* replace the theme vowel of the base verb. Note that each of these markers corresponds to more than one theme vowel, so that an account in purely phonological terms is hard to come up with:

(34)	Continuative		Semelfactive
a.	*bávkit* ‘bang’	–	*bávkalit* ‘make a single bang’
b.	*diškut* ‘splash’	–	*diškalit* ‘splash once’
c.	*goaikut* ‘drip’	–	*goaikalit* ‘drip once’
d.	*speažžut* ‘slap’	–	*speažžalit* ‘slap once’
e.	*duolbmat* ‘tread, step’	–	*duolmmastit* ‘step once, take a step’
f.	*fátmut* ‘embrace, hug’	–	*fátmmastit* ‘embrace, hug once’
g.	*bálkut* ‘throw’	–	*bálkestit* ‘throw once’

From what we have seen so far, the morphology of North Sámi seems to suggest that continuative verbs and semelfactive verbs are formed from the same roots, neither type being more basic than the other. However, the markers *-al-* and *-(a)st-/-(e)st-* also appear in verbs that are clearly derived, such as reciprocal verbs (e.g. *oaidnalit* ‘see each other’, from *oaidnit* ‘see’) and diminutive verbs (e.g. *attestit* ‘give a little’, from *addit* ‘give’). I am therefore inclined to think that the traditional Sámi grammars are right in taking also the semelfactive verbs involving these endings to be more complex than the corresponding continuative verbs.

The direction of derivation is more evident in verb pairs like those shown in (35), where the semelfactive verbs also have a subitive component, meaning that the event happens suddenly. Here the continuative verbs must be more basic, at least semantically, and arguably also morphologically.

(35)	Continuative		Subitive semelfactive
a.	*gossat* ‘cough’	–	*gosádit* ‘suddenly cough once’
b.	*diškut* ‘splash’	–	*diškkádit* ‘suddenly splash once’
c.	*boŋkit* ‘make crashing sound’	–	*boŋkkihit* ‘suddenly crash once’
d.	*gihčat* ‘creak’	–	*gižihit* ‘suddenly creak once’

Summing up, we see that as far as the semelfactive/continuative alternation is concerned, North Sámi has pairs where the continuative verb appears to be more basic than the semelfactive verb, as well as pairs where both verbs are marked to the same degree. What we do not find in North Sámi is pairs where the semelfactive verb is more basic than the continuative verb.

Note that the semelfactive/continuative alternation should not be confused with the derivation of pluractional verbs, some examples of which are shown in (36):

(36)	Base verb		pluractional verb
a.	*báhcit* ‘remain (behind), stay’	>	*bázadit* ‘get, stay behind several times, or several subjects in succession’
b.	*báhčit* ‘shoot, shoot at’	>	*báhčalit* ‘shoot several times, or several subjects shoot’
c.	*vealuhit* ‘make lie down’	>	*vealuhallat* ‘make several objects lie down’

Here the verbs to the right are clearly derived from those to the left. The verbs to the right denote a plurality of events, where the plurality can result from iteration of an event involving the same subject, or several similar events involving different subjects. This is different from continuative verbs corresponding to semelfactives, where the subject is necessarily constant. Moreover, the base verbs of derived pluractional verbs are not necessarily semelfactive, as we see. Hence, the derivation of pluractional verbs is not the reverse of the derivation of semelfactive verbs. It is fundamentally different.

My somewhat tentative conclusion is that in North Sámi, semelfactive verbs are syntactically and semantically more complex than their continuative counterparts, even in cases where the difference is not reflected in the morphology. It is possible that this holds universally, since semelfactive verbs that are more marked morphologically than their continuative counterparts are found also in other languages, such as Russian (see e.g. Dickey and Janda, 2009), Navajo (Young and Morgan, 1987), whereas I have not been able to find any examples of the opposite, that is, continuative verbs that are morphologically derived from semelfactive verbs (if we keep pluractional verbs aside).[14]

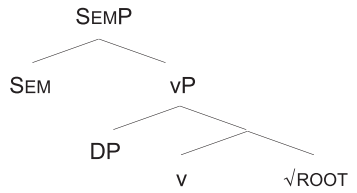
[14] Some languages can form semelfactives by adding free markers to continuative base verbs. This is the case in Scandinavian, as pointed out by Toivonen (2003) for Swedish and by Ramchand and Tungseth (2006) for Norwegian. In the Norwegian examples in (i), from Ramchand and Tungseth (2006:150), we see that the particle/preposition *til* gives a semelfactive reading:

(i) a. *Hun sparka døra.*
she kicked door.DEF
‘She kicked the door.’

b. *Hun sparka til døra.*
she kicked to door.DEF
‘She kicked the door (once).’

The evidence we have so far is compatible with an analysis where semelfactive verbs involve a semelfactive aspectual head which is added outside of vP. The semantic contribution of this head is that it picks out a minimal event in the denotation of the base verb (cf. Rothstein, 2004). Thus, I propose that the structure of North Sámi semelfactives is as shown in (37). Note that in this case, I show the configuration before head movement of the root to v and Sem.

(37)



When it comes to the phonological realisation of the North Sámi semelfactive, we have seen that there is considerable variation. In most cases, the theme vowel of the base verb, which on my analysis is the realisation of v, disappears in the semelfactive. The exception is semelfactives of the type shown in (32), where the theme vowel of the base verb appears to be retained. I will return to this type below. Concerning the semelfactives shown in (31) (the *cirget* type) and in (33) and (34) (with consonantal suffixes), the same questions arise as for the inceptives discussed in the previous section, and the same answer suggests itself, namely, that in the semelfactives, one single vocabulary item represents both the verbaliser and the semelfactive head.

For the semelfactives in (34) one might nevertheless want to propose that the consonantal suffixes represent the semelfactive head, and that the preceding vowels are realisations of v to which readjustment rules have applied. This would however require readjustment rules that refer to the root and also to the feature content of a higher head. For example, for the alternation seen in (34g), *bálkut* 'throw' – *bálkestit* 'throw once', the rule in (38) would have to be formulated:

(38) /u/ → /e/ / {√BALK, . . .} ___ X [SEMELFACTIVE]

Reference to the root is necessary because the /u/ is instead changed to /ɑ/ in (43f), where a different root appears, and reference to the semelfactive is necessary because the fate of the theme vowel /u/ is different when other elements are added over v. For example, it is retained in the infinitive, while it is replaced by /ɑ/ in the diminutive verb *bálkkastit* 'throw a little' and by /o/ in the frequentative verb *bálkkodit* 'keep throwing for some time'.

Compared to this, a spanning analysis gives a much simpler representation of the alternants. On this analysis, the verbaliser and the semelfactive head are spelled out together, which is allowed since the verbaliser heads the complement of the semelfactive head. The relevant vocabulary items can be specified as in (39).

(39) a. <v, SEM> ↔ /e/ /{√CIRG,√ČAVG,√ČUORV, . . .} ___
b. <v, SEM> ↔ /ɑl/ /{√BÁVK,√DIŠK,√GOAIK, . . .} ___
c. <v, SEM> ↔ /ɑst/ /{√DUOLBM,√FÁTM,. . .} ___
d. <v, SEM> ↔ /est/ /{√BÁLK,. . .} ___

In these entries, reference is made to the two heads that the vocabulary item spells out, and to the set of roots that each individual marker combines with. This means that the vocabulary entries for the markers that appear in the low semelfactive are no more complex than the entries for the realisations of the verbaliser alone, which also must make reference to the sequence to be spelled out (in these cases consisting of one head) and to the list of roots that each individual marker combines with.

Now recall that in semelfactives of the type shown in (32), it might be that the marker *-d-* spells out the semelfactive head while the theme vowel *-a-* spells out v. If this is correct, the vocabulary entry for the suffixed *-d-* has to be morphosyntactically and contextually specified as in (40).

(40) SEM ↔ /d/ /{√ČORBM,√ČUOLBM, √HOIG, √NORD, . . .} ___

This will ensure that the *-d-* appears with the right roots. Making reference only to the theme vowel *-a-* will not suffice, since not all verbs with *-a-* as theme vowel form the semelfactive by means of the *-d-* – see examples in (31b) and (33e).

Concerning the subitive semelfactives shown in (35), it is possible that the derivational suffixes here represent three heads: v, SEM and a subitive element. For reasons of space I will not go into a detailed discussion of these verbs.

4.3. Passive verbs

Alternations in the theme vowels can also mark the passive in North Sámi. Some verbs have two passive forms: a short passive, which is formed by changing the theme vowel to /o/, and a long passive, where the suffix *-juvvo-* is also added.[15] The long and the short forms are to a large extent used interchangeably.[16] Some examples of verbs with long and short passives are shown in (41).

(41)	Active		Passive
a.	*borrat* 'eat'	>	*borrot, borrojuvvot* 'be eaten'
b.	*rahpat* 'open'	>	*rahppot, rahppojuvvot* 'be opened'
c.	*addit* 'give'	>	*addot, addojuvvot* 'be given'
d.	*máksit* 'pay'	>	*máksot, máksojuvvot* 'be paid'
e.	*goarrut* 'sew'	>	*gorrot, gorrojuvvot* 'be sewn'

We see that the base verbs in (41) all are made up of a monosyllabic root plus a theme vowel /ɑ/, /i/ or /u/. Verbs with /a/, /e/ or /o/ only take *-juvvo-* in the passive, as shown in (42), while consonant-final stems take the passive marker *-uvvo-*, as shown in (43).

(42)	Active	Passive
a.	*sahát* 'saw'	*sahájuvvot* 'be sawn'
b.	*čorget* 'make clean, tidy'	*čorgejuvvot* 'be cleaned, tidied'
c.	*dulkot* 'interpret'	*dulkojuvvot* 'be interpreted'

(43)	Active	Passive
a.	*buoridit* 'improve'	*buoriduvvot* 'be improved'
b.	*guhkidit* 'lengthen'	*guhkiduvvot* 'be lengthened'
c.	*jorgalit* 'turn; translate'	*jorgaluvvot* 'be turned; be translated'
d.	*muitalit* 'tell'	*muitaluvvot* 'be told'
e.	*fierahit* 'roll'	*fierahuvvot* 'be rolled'
f.	*seaguhit* 'mix'	*seaguhuvvot* 'be mixed'

Passive verbs in North Sámi are inflected for tense and agreement in the same way as active verbs, with inflectional markers added outside the passive marker. In (44) I give two examples of the passive of (the transitive) *rahpat* 'open' – the short passive in (44a) and the long passive in (44b). As we see, there is no auxiliary in the passive, just the inflected passive verb.[17]

(44) a. *Čájáhus* *rahpp-u-i* *mannan* *lávvordaga.*
exhibition.NOM open-PASS-PAST.3SG last Saturday.GEN
'The exhibition was opened last Saturday.'

b. *Čuoigan-guovddáš* *rahppo-juvvu-i* *guovvamánus.*
skiing-centre.NOM open-PASS-PAST.3SG February.LOC
'The ski centre was opened in February.'

Since passive verbs take the same inflectional categories as other verbs, and since the passive is restricted in its application – only verbs with an external argument can be passivised – the passive is for all practical purposes comparable to derivational categories. And since the passive can also cause a change in the theme vowel, there is good reason to include it in the discussion in this paper.

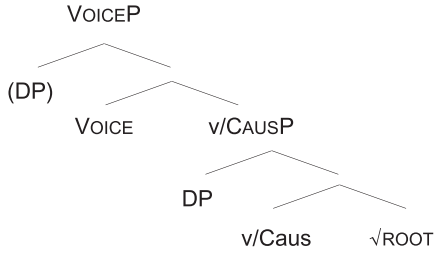
[15] In addition, the consonant centre appears in the strongest grade in the passive.

[16] As noted e.g. by Nielsen (1926:272f.) and Nickel (1990:227), there are cases where the verb with *-o-* has a different meaning than the verb with *-ojuvvo-*. However, it appears that the shorter verb is not then really a passive. For example, *haksit* is transitive and means 'smell', and the corresponding long passive *haksojuvvot* means 'be smelled', while the shorter *haksot* is the intransitive 'smell'.

[17] The forms *rahppui* in (44a) and *rahppojuvvui* in (44b) is due to a general phonological rule that raises the final /o/ to /u/ before the past tense marker /i/.

In (43) it is clear that the passive marker *-uvvo-* is added outside a causative marker for example in *buoriduvvot*, the passive of *buoridit* 'improve', related to the adjective *buorre* 'good', and also in *fierahuvvot*, the passive of *fierahit* 'roll', formed from the intransitive *fierrat* 'roll'. If we take the passive marker to be the realisation of a Voice head with the feature [passive], this is consistent with Vinka's (2002) claim that Caus is separate from Voice in North Sámi. Hence, in the terms of Pylkkänen (2002), there is no bundling of Caus and Voice in this language. I also think Vinka (2002) is right in assuming that the causative head in verbs like *buoridit* is also the verbaliser. In other words, these verbs involve a root-selecting causative, in the terms of Pylkkänen (2002), which means that their syntactic structure is as shown in (45):

(45)



As the examples in (43) indicate, the realisation of the transitive/causative verbaliser is subject to some variation. In *buoridit* 'improve', in *guhkidit* 'lengthen', and in quite a few other verbs, it is spelled out as *-d-*, while in *fierahit* 'roll' and *seaguhit* 'mix' it is spelled out as *-h-*. The suffix *-h-* is also the causative marker found in the productive ''syntactic'' causative, such as *viegahit* 'cause to run', from *viehkat* 'run' (see Vinka, 2002).[18] Hence, *-h-* is arguably the default realisation of the causative. Then what about transitive verbs like *rahpat* 'open', with causative semantics but with only a theme vowel following the root? Given what we have seen earlier in this paper, a reasonable assumption is that the theme vowel in *rahpat* also spells out the causative verbaliser. The vocabulary entries in (46) can then be formulated:

(46) a. Caus ↔ /ɑ/ / {√RAHP, . . .} ___
b. Caus ↔ /d/ / {√GUHK, . . .} ___
c. Caus ↔ /h/

For the vocabulary items that spell out the passive Voice head the following entries can be given, since the passive marker *-uvvo-* appears after consonants, while the marker *-juvvo-* can appear after all vowels.[19]

(47) a. [PASSIVE] ↔ /uvvo/ / C ___
b. [PASSIVE] ↔ /juvvo/ / V ___

The remaining problem is now the theme vowel /o/ that appears in the passives in (41), and also the zero passive marker that may appear with it.[20] The following observations can be made: the theme vowel /o/ in the passive obligatorily replaces /ɑ/, /i/ or /u/, but not /a/ or /e/, as seen in (42ab). The zero passive marker only appears after an /o/ that has replaced an /ɑ/, /i/ or /u/. It does not appear in passives formed from verbs that have /o/ as theme vowel to begin with, such as *dulkot* 'interpret' in (42c). These facts point to a readjustment analysis of the /o/ that appears in passives. Firstly, the zero passive marker must be specified to appear after the theme vowels /ɑ/, /i/ or /u/, as indicated in (48).

(48) [PASSIVE] ↔ Ø / {/ɑ/, /i/, /u/} ___

[18] The causative element in *viegahit* 'cause to run' is an example of a verb-selecting causative, i.e. a causative that takes a vP as complement (Pylkkänen, 2002).

[19] An anonymous reviewer suggests that the alternation between the two passive markers *-juvvo-* and *-uvvo-* is a consequence of a phonological rule that deletes the initial consonant of the affix when it attaches to a consonant-final stem, and also that the phonology is the source of many other cases of allomorphy in North Sámi. While I agree that it would be preferable to have as many allomorphic alternations as possible taken care of by the phonology, so that the number of vocabulary items could be reduced, I am not convinced that a general rule can be postulated for North Sámi that deletes the initial consonant of affixes that attach to consonant-final stems. If there is no such general rule, a phonological rule applying specifically to the alternation *-juvvo/-uvvo-* is no simplification of the grammar. Hence, for the purpose of this paper I will stick to the vocabulary items given in (47).

[20] As described e.g. in Sammallahti (1998), the /o/ was originally a passive marker of its own, so that the long passive forms found today are, from a diachronic point of view, doubly marked for passive. However, since I take it for granted that any passive verb in North Sámi involves only one Voice head, I take the last of these markers to actually represent this head in present-day North Sámi.

Since the zero passive marker is in free variation with the suffix *-juvvo-* in verbs that have /ɑ/, /i/, /u/ as theme vowel in the active, the contextual specification in (48) must count as equal to the specification in (47b). Regardless of whether *-juvvo-* or the zero marker is chosen, the theme vowel, if it is /ɑ/, /i/ or /u/, will in the next step be changed to /o/ by the readjustment rule in (49).

(49) V → /o/ / X ___ [PASSIVE], X = {/i/, /u/, /ɑ/}

Thus, when the zero passive marker is chosen, the passive feature is reflected only indirectly in the morphological form. The only overt indication of the presence of the passive feature in the short passive is that the theme vowel is /o/.

The vocabulary entries in (47) and (48) make reference to phonological properties at the insertion site. In early versions of Distributed Morphology it was assumed that phonological features could not be a part of the contextual specification of a vocabulary item (see e.g. Halle and Marantz, 1994). More recently, several researchers have argued that vocabulary items may be sensitive to the phonological properties of items that are located inside them, or, in other words, that represent more deeply embedded constituents (see e.g. Bobaljik, 2000; Embick, 2010; Arregi and Nevins, 2013). The vocabulary items proposed in (47) and (48) are in accordance with these proposals. But note that if vocabulary items can be contextually specified for phonological features, vocabulary insertion must be strictly cyclic, so that for each insertion operation, the vocabulary item that was inserted in the previous operation must be inspected to ensure that its phonological form is not in conflict with the item about to be inserted. The readjustment rule in (49) must however apply after vocabulary insertion is completed.

In (48), the theme vowels /ɑ/, /i/ and /u/ are treated as a group. This also happens in many other cases in North Sámi. It might therefore be justified to use a diacritic to refer to the set {/ɑ/, /i/, /u/}, for example V_{α}. The plausibility and usefulness of this designation will be more evident in the next section, where I give a very condensed presentation of the conjugation of North Sámi verbs, addressing the fact that inceptives, semelfactives and passives do not belong to the same conjugation class as their respective base verbs.

5. On conjugation classes in North Sámi

In the preceding section we saw that in certain types of deverbal derived verbs in North Sámi, the only overt indication that a derivational category is present is that the verb has a different theme vowel from what it would have in the absence of the derivational category. A striking fact is that in all these cases, the base verb belongs to the conjugation class called even-syllabled, whereas the derived verb belongs to the so-called contracted class. I will not attempt to explain this regularity here, but I will nevertheless use it to show that in North Sámi, conjugation class membership is not determined by the root. Instead, I argue that conjugation classes fall out from the specification of individual vocabulary items that express verbal inflectional features. In addition, consideration of some of the vocabulary items that express verbal inflection will lead to the formulation of the Principle of Maximal Expression, which is a revised version of the principle for vocabulary insertion given in (6) above.

The reason why one of the three conjugation classes found in North Sámi is traditionally called even-syllabled verbs is the fact that in these verbs, the last prosodic foot of the infinitive consists of two syllables (see e.g. Nickel, 1990). We have already seen many verbs belonging to this class, such as *diehtit* ‘know’, *njuikut* ‘jump’ and *rahpat* ‘open’. In verbs belonging to this class, the theme vowel (in the infinitive) is /ɑ/, /i/ or /u/. They contrast with verbs that have /a/, /e/ or /o/ as theme vowel, which constitute the class called contracted verbs. Examples of contracted verbs are *ballát* ‘begin to fear’, *njuiket* ‘jump once’, and *dulkot* ‘interpret’. Since verbs of both these classes have vowel-final stems, they contrast with the third conjugation class, traditionally referred to as odd-syllabled verbs, since the last prosodic foot of the infinitive consists of three syllables. We have also seen verbs belonging to this class, for example *goikkiidit* ‘begin to dry’, *goaikalit* ‘drip once’ and *seaguhit* ‘mix’. Verbs belonging to the latter conjugation are characterised by having consonant-final stems, thus contrasting with the two other classes, which all have vowel-final stems (cf. e.g. Sammallahti, 1998).[21]

[21] As the examples given in this paper suggest, many consonant-final verbs are morphologically and syntactically complex. This does not mean that all consonant-final verbs are equally complex, but I will not attempt to provide a general account of these verbs, since the focus of this paper is the theme vowels found in vowel-final and contracted verb stems.

Some consonant-final verbs have corresponding nouns, but the morphological patterns are more intricate than those seen in section 3. I give some examples of consonant-final verbs and their corresponding nouns in (i).

(i)	VERB		NOUN
a.	*veahkehit* ‘help’	–	*veahkki* ‘help’
b.	*gielistit* ‘lie’	–	*gielis* ‘lie’
c.	*muitalit* ‘tell’	–	*muitalus* ‘story’

As I have already mentioned, verbs where the only overt sign that a derivation has taken place is the change of theme vowel, all belong to the contracted class, while the corresponding base verbs are even-syllabled. Consequently, it cannot hold for North Sámi that conjugation class membership is marked as a diacritic feature on the root, as Embick and Halle (2005:46) propose. In North Sámi, one and the same root can appear in different verbs belonging to different conjugation classes. The root √BALL, for example, is found in the vowel-final verb *ballat* as well as in the contracted verb *ballát* (a similar point is made for Italian in Acquaviva, 2009).

The North Sámi verbal conjugation involves a very large number of forms, and a full treatment of all conjugation patterns is therefore far beyond the scope of this paper. In order to demonstrate a couple of points that I see as important, I will only present some present and past tense forms of even-syllabled verbs in (50) and some present and past tense forms of contracted verbs in (51).

(50) Selected forms of the vowel-final verbs *ballat* 'fear', *čavgat* 'tighten, stretch', *diehtit* 'know' and *njuikut* 'jump several times'

PRESENT INDICATIVE

1SG	*balan*	*čavggan*	*dieđán*	*njuikkun*
2SG	*balat*	*čavggat*	*dieđát*	*njuikkut*
3SG	*ballá*	*čavgá*	*diehtá*	*njuiku*

PAST INDICATIVE

1SG	*ballen*	*čavgen*	*dihten*	*njuikon*
2SG	*ballet*	*čavget*	*dihtet*	*njuikot*
3SG	*balai*	*čavggai*	*diđii*	*njuikkui*

(51) Selected forms of the contracted verbs *ballát* 'begin to fear', *sahát* 'saw', *čavget* 'tighten, stretch, once', *njuiket* 'jump once' and *borrot* 'be eaten'

PRESENT INDICATIVE

1SG	*ballán*	*sahán*	*čavgen*	*njuiken*	*borron*
2SG	*ballát*	*sahát*	*čavget*	*njuiket*	*borrot*
3SG	*ballá*	*sahá*	*čavge*	*njuike*	*borro*

PAST INDICATIVE

1SG	*ballájin*	*sahájin*	*čavgejin*	*njuikejin*	*borrojin*
2SG	*ballájit*	*sahájit*	*čavgejit*	*njuikejit*	*borrojit*
3SG	*ballái*	*sahái*	*čavgii*	*njuikii*	*borrui*

One will note that the theme vowels of contracted verbs are more stable than the theme vowels of even-syllabled verbs. In fact, the theme vowels of contracted verbs are only affected by general phonological processes. Historically, these vowels are the result of contraction of two syllables (see e.g. Nielsen, 1926:163; Korhonen, 1967:23). Hence, their stability is probably ultimately a consequence of the history of the original class members. But from a synchronic point of view, the observed stability is an inherent property of the theme vowels /e/, /o/ or /a/, seen even in verbs that are more recent loans from Scandinavian and which consequently have not undergone the changes that have applied to other contracted verbs. Some relatively recent loans are shown in (52):

(52)

	NOUN		VERB
a.	*plána* 'plan'	–	*plánet* 'plan'
b.	*kárta* 'map'	–	*kártet* 'map'
c.	*dulka* 'interpreter'	–	*dulkot* 'interpret'
d.	*sahá* 'saw'	–	*sahát* 'saw'
e.	*skeittá* 'skate'	–	*skeittát* 'skate'

We also see that the verbs in (52) are related to nouns in such a way that we could reasonably assume here that the theme vowels are realisations of the nominalising and the verbalising heads. Nevertheless, all these verbs show the same morphological behaviour as other contracted verbs.

For space reasons, I will not go through all the forms in (50) and (51) here. I will point out that the present tense could be taken to be represented by a zero marker, and that the marker for first person singular always ends with an /n/, while the marker for second person singular ends with a /t/. Third person singular is marked with zero. The past tense forms represent more of a challenge. For example, what determines the distribution of the markers /en/ and /jin/ that mark the

past tense first person singular of even-syllabled and contracted verbs, respectively? These two competing markers will serve here as an illustration of how the two different paradigms arise.

A structural specification, such as reference to the complement of the Tense head, would not give the desired result. In the contracted verb *ballát* 'begin to fear' the complement of Tense is headed by the inceptive, while in *sahát* 'saw' there is no inceptive element, and since it is a transitive verb, the complement of Tense is here a VoiceP. Nevertheless, these two verbs are inflected in the same way, and so is the unaccusative stative *buohccát* 'be ill', where the complement of T is just a vP.

My proposal is that the vocabulary item /jin/, which expresses the past tense first person singular of contracted verbs, is specified to appear after the vowels /e/ /o/ or /a/, the theme vowels found in contracted verbs. If vocabulary insertion is determined locally, this is the only way to derive the distribution of /jin/. Hence, the vocabulary entry for /jin/ is as shown in (53a), or, alternatively, as in (53b), where the relevant set of vowels is represented as V_{β}.

(53) a. <PAST, 1SG> ↔ /jin/ / {/e/ /o/ /a/} ___
b. <PAST, 1SG> ↔ /jin/ / V_{β} ___

It follows that *ballát* 'begin to fear', *sahát* 'saw', and all other contracted verbs will take the past tense first person singular marker /jin/, while /jin/ will not appear in the paradigms of even-syllabled verbs, which have /i/, /u/ or /ɑ/ as their theme vowel, or, expressed differently, a V_{α}.

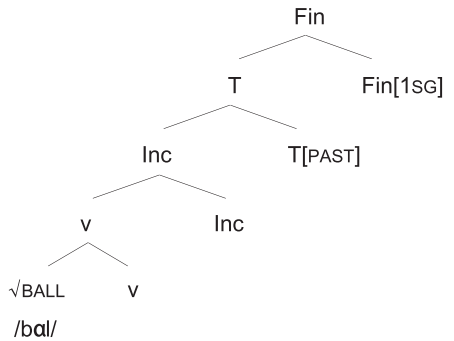
It is important to note here that /jin/ is not excluded from appearing after the vowels /i/, /u/ or /ɑ/ for phonological reasons. It is easy to find examples of the sequence /ji/ following these vowels, such as *sajiin*, the locative singular of *sadji* 'place', *dujiin*, the locative singular of *duodji* 'handicraft', or *poesiijii*, illative singular of *poesijia* 'poetry'. Thus, the fact that the inflectional marker /jin/ only follows the vowels /e/ /o/ or /a/ is a purely morphological fact.

Then what about the marker /en/ seen in *ballen*, the past first person singular of the even-syllabled *ballat* 'fear'? This marker is adjacent to the root, and in the past third person singular form *balai* it is replaced by a sequence made up of the theme vowel /ɑ/ and the past tense marker /i/. Hence, /en/ appears to represent both the verbaliser and the past tense, in addition to person and number features. It must also be specified to appear with a certain set of roots, to prevent it from appearing with *njuik-*, for example, which takes /on/ instead (see (50)). The vocabulary entry for /en/ can be given as in (54).

(54) <v, PAST, 1SG> ↔ /en/ / {√BALL, √ČAVG…} ___

The question is then why /en/ does not appear in the paradigm of the inceptive verb *ballát*. In fact, the syntactic structure of *ballát* would also meet the specification in (54). Consider (55), where I present the complex syntactic head that underlies an inflected finite inceptive verb in North Sámi. The tense features are located in the Tense head, while the subject agreement features are located in a head that also encodes finiteness and is situated above Tense (cf. Julien, 2003, and also Holmberg et al., 1993 on Finnish).

(55)



When the root √BALL combines with a stative verbaliser, an inceptive head, a Tense head with the feature [PAST] and a Fin head with the features [1SG], as in (55), we would expect that the vocabulary item /en/ could be inserted as the exponent of all heads from v upwards. This does however not happen. Instead, the structure in (55) is matched first with a vocabulary item that spells out the verbaliser plus the inceptive head, given earlier as (29d) and repeated below as (56) – and then with the vocabulary item given in (53), so that the result of vocabulary insertion is the form *ballájin*.

(56) <v, INC>↔ /a/

Given that the item in (54) has a richer morphosyntactic specification than the item in (56), the item in (54) should win the competition for insertion if competition between vocabulary items is regulated as expressed in (6) above. I repeat (6) here for convenience:

(6) *Vocabulary Insertion* (Halle and Marantz, 1993:121)
The phonological exponent of a Vocabulary Item is inserted into a morpheme of the terminal string if the item matches all or only a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary Item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features in the terminal morpheme must apply.

Note in particular the last sentence in (6): ''the item matching the greatest number of features in the terminal morpheme must apply''. If this holds also in cases of spanning, where one vocabulary item spells out more than one terminal morpheme, a vocabulary item matching the sequence <v, PAST, 1SG> should prevent a vocabulary item matching the sequence <v, INC> from being inserted if all the relevant features are present in the structure. The fact that this is not the result when (54) competes with (56), that is, when the complex head shown in (55) has been built and the root has been spelled out as /bɑl/, suggests that (6) should be reformulated.

I propose that (6) should be reformulated as in (57) – where ''trivial sequence'' means a sequence consisting of a single terminal node:

(57) *The Principle of Maximal Expression*
The phonological exponent of a Vocabulary Item is inserted into the terminal string if the item matches all or only a subset of the grammatical features specified in a (possibly trivial) sequence of terminal morphemes. Insertion does not take place if the Vocabulary Item contains features not present in the sequence. Where several Vocabulary Items meet the conditions for insertion, the item leaving the smallest number of features in the terminal sequence unexpressed must apply.

As we see, the Principle of Maximal Expression, as I call it, says that while no vocabulary item can be inserted if it is specified for features that are not present at the insertion site, the winner among all matching items is the one that leaves the smallest number of features unexpressed. Note that leaving the smallest number of features unexpressed is not equivalent to matching the greatest number of features, if only one vocabulary item is considered at a time.

Hence, what happens in (55) after the root has been matched with /bɑl/ is that the item in (54) is compared to the item in (56), and the latter wins because it does not leave the inceptive head unexpressed. Since Vocabulary Insertion can apply only once to any given terminal node (Embick and Marantz, 2008), insertion of (56), which gives the theme vowel /a/, paves the way for the insertion of the item in (53) in the next step, so that the resulting verb form is *ballájin*.

We see now that conjugation class membership cannot depend only on the root in North Sámi. Instead, conjugation classes arise as a consequence of the specifications of individual vocabulary items, together with the principle of maximal expression, which regulates the competition between them.

Other principles regulating the competition between vocabulary items have however been proposed in the literature, in addition to the Subset Principle given in (6). For example, Caha (2009) formulates the condition in (58):

(58) The Elsewhere Condition (Caha, 2009:18)
In case two rules, R1 and R2, can apply in an environment E, R1 takes precedence over R2 if it applies in a proper subset of environments compared to R2.

This condition would lead to the vocabulary item in (56), which spells out the span <v, INC>, being selected when an inceptive head is present, and not the item in (54), which spells out the span <v, PAST, 1SG>, since the (56) applies in a proper subset of the environments where (54) could apply. Nevertheless, a problem with this condition is that it requires comparison between derivations. At the point where (54) or (56) can be inserted in an inceptive structure like (55), it would be necessary to take into account that there also exist structures where the inceptive head is not present, in order to see the subset relation between (54) and (56). However, if vocabulary insertion is locally determined, as I am assuming here, comparison across structures is not possible.

The principle proposed by Siddiqi (2009) and called *Minimize Exponence* can also be consideref:

(59) Minimize Exponence (Siddiqi, 2009:4)
The most economical derivation will be the one that maximally realizes all the formal features of the derivation with the fewest morphemes.

Siddiqi demonstrates that the principle in (59) leads, for example, to the form *ate* being chosen over *eated* as the past tense form of the English verb *eat*, since *ate* only consists of one morpheme whereas *eated* is made up of two. Although Siddiqi assumes that spelling out more than one node by one single vocabulary item is made possible through fusion, the principle could be adapted to a model where spanning is allowed, and where in addition vocabulary insertion is locally determined. The decision would then be made at the point where the options are either spelling out the root as *eat* or else spelling out the root, the verbaliser and the tense head as *ate*. Minimise Exponence would dictate that the latter option should be chosen. However, if vocabulary items can be underspecified, a common assumption in DM also adopted by Siddiqi, it is not clear that Minimise Exponence would give the right result in the North Sámi case discussed above. Since /en/ in (54) spells out the span from v to Fin, while /a/ in (56) spells out only v and Inc, Minimise Exponence would probably select /en/ even if an inceptive head were present. The fact that /en/ is not specified for Inc could not block this vocabulary item from being inserted in that context. Only the Principle of Maximal Expression guarantees that the inceptive verb and the corresponding base verb appear with different inflectional markers, as required.

6. Interaction between semelfactive, inceptive and passive

The main topic of this paper is the three North Sámi verbal derivation types that were presented and discussed in section 4. All three types apply low down in the clause and can be expressed morphologically as a change of the theme vowel of the base verb. These three derivation types – (low) inceptive, semelfactive and passive – are the only verbal derivational categories in North Sámi that can have change of theme vowel as their only morphological marking. The question is now if and how these three interact – can, for example, the theme vowel of a base verb be changed more than once if two or more of the vowel-changing categories are added? In the following, I look first at the combination of semelfactive and inceptive, and then at the combination of these two categories with passive.

6.1. Semelfactive and inceptive

We can note first that for semantic reasons, it is not possible to derive a semelfactive verb from an inceptive. An inceptive verb is an achievement in Vendler's (1957) classification. The aspectual properties of inceptives is illustrated in (60). The main verb in (60a) is the activity verb *duoldat* 'boil', and as we see, it combines with a time span adverbial, whereas *duldii* in (60b) is a past tense form of the inceptive verb *duldet* 'begin to boil', and it combines with a time frame adverbial. This shows that the inceptive verb is telic while its base verb is atelic.

(60) a. *Divtte smávvát duoldat sullii 20 minuhta.*
let.IMP little.ADV boil.INF around 20 minute.ACC
'Let simmer for around 20 minutes.'

b. *Gáffe duldii 5 minuhtas.*
coffee.NOM boil.INC.PAST.3SG 5 minute.LOC
'The coffee started to boil in 5 minutes.'

Since semelfactives can only be formed from activity verbs (cf. Rothstein, 2004), inceptive verbs cannot be input to semelfactive formation.

One might however expect that inceptive verbs could be derived from semelfactives. As Rothstein (2004) points out, semelfactives are not punctual. They occupy intervals, which can be seen from the fact that they can appear in the progressive in English, and in addition, they induce the imperfective paradox. Rothstein (2004:184) illustrates both these properties with the example shown in (61):

(61) *John was laughing when he saw me, so he turned it into a cough (and didn't laugh).*

Now if semelfactives occupy intervals, it should be possible to refer to the beginning of the interval, i.e. to the beginning of the semelfactive event, by means of an inceptive. For example, the onset of a single sneezing event can be described as in (62) (cf. Freed, 1979:72):

(62) *I began to sneeze but only got as far as 'Aaah-Ch...'*

In spite of this, we do not find in North Sámi low inceptives that are derived from semelfactives. Semelfactives only appear in high inceptives, that is, inceptives formed by means of the inceptive auxiliaries *álgit* and *-goahtit*, which were shown in (17)–(20). In (63), we have an example where *-goahtit* combines with the semelfactive *lebbet* 'spread out once' (see (31e)):

(63) *Marko ja su bargoolmmái beasaiga lebb-e-goahtit mátta.*
Marko and his colleague get.to.PAST.3DU spread-SEM-begin.INF mat.ACC
'Marko and his colleague got to start spreading out the mat.'

Since high inceptives can be derived from semelfactives in North Sámi, the absence of low inceptives derived from semelfactives cannot be due to semantic factors. Instead, I think the explanation is syntactic: both the inceptive head and the semelfactive head take the minimal vP as complement, and because of this, the two cannot co-occur. The high inceptive, by contrast, can take larger verbal complements, and is therefore compatible also with semelfactives.

6.2. Passive with inceptive and semelfactive

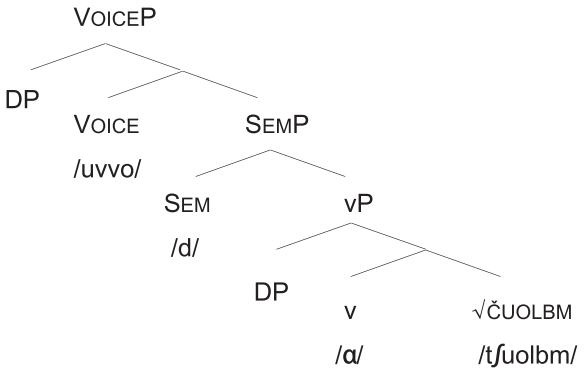
For structural reasons, the passive and the low inceptive do not interact. As already noted, low inceptives can only be formed from stative and activity verbs that do not have an agentive external argument. It follows that low inceptives do not involve a Voice head, and they can never be passivised. And since a passive verb necessarily involves a Voice head, the head that introduces the agent, passives can never be input to low inceptive formation.

Some of the semelfactive verbs shown in section 4.2, on the other hand, have meanings that indicate that they have agentive subjects. One example is *čavget* 'tighten, stretch, once' in (31b), another is *čuolbmadit* 'tie once, tie one knot' in (32c). The presence of an agent suggests that the syntactic structure includes a Voice head, and consequently, we would expect that these semelfactive verbs could be passivised. This is borne out. It is however at bit unexpected that the passive marker then appears outside the semelfactive marker, as seen in (64):

(64) *Gámá-suoin-gieđahas čuolbma-d-uvvo ovdal go cábmá.*
brogue-grass-bunch.NOM tie-SEM-PASS.PRES.3SG before beat.PRES.3SG
'The bunch of bladder sedge is tied before one beats it.'

The order of elements in *čuolbmaduvvo* 'is tied' suggests that the semelfactive head is situated lower that the Voice head, so that when the Voice head and the external argument enter the derivation, the verb is already semelfactive. The syntactic structure of the verb phrase corresponding to the passive semelfactive verb *čuolbmaduvvot* 'be tied once' is then as sketched in (65).

(65)



As indicated here, I take this verb to be built from the root *čuolbm-*, a verbaliser (a v head) that is spelled out as /ɑ/, a semelfactive head spelled out as /d/, and a passive Voice head which is spelled out as /uvvo/, since there is a consonant preceding it. The structure in (63) is in line with the suggestion in section 4 that the semelfactive head takes a minimal vP as its complement. In addition, it explains the fact that deriving semelfactives from passives is not possible in North Sámi.

The example in (64) involves a verb where the semelfactive is marked by a consonantal marker. Notably, it is also possible to passivise a semelfactive verb which is marked by change of theme vowel. This is then the only case where one potentially vowel-changing derivational category applies after another. I give an example in (66), where the /e/ in the second syllable of the passive *čavgejuvvon* 'tightened, stretched' shows that the passive verb must be formed from the semelfactive *čavget* 'tighten, stretch, once', and not from the continuative *čavgat* 'tighten, stretch' (see (31b)).

(66) *Báddi lei čavg-e-juvvo-n guovtte muora gaskii.*
rope.NOM was tighten-SEM-PASS-PAST.PTC two.GEN tree.GEN between
'The rope was tightened between two trees.'

We see that the passive suffix is /juvvo/, just like in the long passives shown in (41) above, but since the conditions for the readjustment rule that changes theme vowels to /o/ in the passive are not met (see (49)), the theme vowel /e/ in *čavget* remains unaltered. We can therefore formulate the generalisation that a derivational process that leads to a change of theme vowel can only apply once to any given base verb. The verb will then get one of the theme vowels /e/, /o/ or /a/, and no further derivational processes can change this vowel.

7. Conclusions

In this paper, I have shown that theme vowels in North Sámi in many cases represent verbalising and nominalising heads, i.e. v and n. There are however also cases where a derivational category is reflected in the word form only as a change of theme vowel. The categories in question are inceptives, semelfactives and passives. On my analysis, the change of theme vowel in inceptive and semelfactive verbs arises when the verbaliser and the inceptive or semelfactive head are spelled out together by one single vocabulary item, so-called spanning. The vocabulary items in question are strictly adjacent to the root, so that the root-conditioned allomorphy seen in the marking of inceptive and semelfactive is determined locally.

The change of theme vowel seen in some passive forms, on the other hand, is analysed as the consequence of a readjustment rule triggered by a passive Voice head. In the cases where the rule applies, the passive Voice head itself can be spelled out as zero or as a segmental suffix.

The result of changing the theme vowel is invariably a verb belonging to the class of contracted verbs, a conjugation class that also comprises many non-derived verbs. Since the underlying syntax of the verb varies, the inflectional vocabulary items that appear with verbs of this class must make reference to the phonological form of the vocabulary item inserted immediately below. This means that vocabulary insertion must be strictly cyclic and proceed from the bottom up. In addition, the conflict that arises when a vocabulary item representing a larger sequence of terminal nodes competes with an item representing a smaller sequence is resolved by the Principle of Maximal Expression, which states that when two or more vocabulary items meet the conditions for insertion, the winner is the item that leaves the smallest number of features in the terminal sequence unexpressed.

Acknowledgements

The research for this paper was financially supported by Bank of Sweden Tercentenary Foundation, grant no. P12-0188:1. Concerning the contents of the paper, audiences at the Grammar Seminar, Lund University, at Grammar in Focus, Lund university, at CASTL, University of Tromsø, at WCCFL 33 in Vancouver, and at the 25th Colloquium on Generative Grammar at IKER, Bayonne, have provided very helpful feedback, and so have three anonymous Lingua reviewers. My heartfelt thanks go to them all.

References

Acquaviva, P., 2009. Roots and lexicality in Distributed Morphology. In: Galani, A., Redinger, D., Yeo, N. (Eds.), York-Essex Morphology Meeting 5, pp. 1–21.

Alexiadou, A., Anagnostopoulou, E., Schäfer, F., 2006. The properties of anticausatives crosslinguistically. In: Frascarelli, M. (Ed.), Phases of Interpretation. Mouton de Gruyter, Berlin, pp. 187–212.

Arregi, K., Nevins, A., 2013. Contextual neutralization and the Elsewhere Principle. In: Matushansky, O., Marantz, A. (Eds.), Distributed Morphology Today: Morphemes for Morris Halle. MIT Press, Cambridge, pp. 199–221.

Baal, B.A.B., Odden, D., Rice, C., 2012. An analysis of North Saami gradation. Phonology 29, 165–212.

Bals, B.A., Odden, D., Rice, C., 2005. Topics in North Saami Phonology (Master's thesis). University of Tromsø and Ohio State University Available at: www.ling.ohio-state.edu/∼odden/Saami.pdf

Bermúdez-Otero, R., 2012. The architecture of grammar and the division of labour in exponence. In: Trommer, J. (Ed.), The Morphology and Phonology of Exponence. Oxford University Press, Oxford, pp. 8–83.

Bobaljik, J.D., 2000. The ins and outs of contextual allomorphy. In: Grohmann, K.K., Struijke, C. (Eds.), University of Maryland Working Papers in Linguistics 10. University of Maryland, College Park, pp. 35–71.

Borer, H., 2003. Exo-skeletal vs. endo-skeletal explanations: syntactic projections and the lexicon. In: Moore, J., Polinsky, M. (Eds.), The Nature of Explanation in Linguistic Theory. CSLI Publications, Stanford, pp. 31–67.

Caha, P., 2009. The Nanosyntax of Case (Doctoral dissertation). University of Tromsø.

Casali, R.F., 1998. Resolving Hiatus (Doctoral dissertation). University of California, Los Angeles.

Dickey, S.M., Janda, L.A., 2009. Хохотнул, схитрил: the relationship between semelfactives formed with -nu- and s- in Russian. Russ. Linguist. 33, 229–248.

Embick, D., 2010. Localism Versus Globalism in Morphology and Phonology. The MIT Press, Cambridge.

Embick, D., 2013. Locality across domains: From morphemes to structures to sounds. NELS 44.

Embick, D., Halle, M., 2005. On the status of stems in morphological theory. In: Geerts, T., van Ginneken, I., Jacobs, H. (Eds.), Romance Languages and Linguistic Theory 2003: Selected Papers from Going Romance 2003. John Benjamins, Amsterdam, pp. 37–62.

Embick, D., Marantz, A., 2008. Architecture and blocking. Linguist. Inq. 39, 1–53.
Embick, D., Noyer, R., 2007. Distributed morphology and the syntax/morphology interface. In: Ramchand, G., Reiss, C. (Eds.), The Oxford Handbook of Linguistic Interfaces. Oxford University Press, Oxford, pp. 289–324.
Folli, R., Harley, H., 2007. Causation, obligation, and argument structure: on the nature of little v. Linguist. Inq. 38, 197–238.
Freed, A.F., 1979. The Semantics of English Aspectual Complementation. Reidel, Dordrecht.
Halle, M., 1997. Distributed morphology: impoverishment and fission. In: Bruening, B., Kang, Y., McGinnis, M. (Eds.), MITWPL 30: PF: Papers at the Interface. MITWPL, Cambridge, pp. 425–449.
Halle, M., Marantz, A., 1993. Distributed morphology and the pieces of inflection. In: Hale, K., Keyser, S.J. (Eds.), The View from Building 20. The MIT Press, Cambridge, pp. 111–176.
Halle, M., Marantz, A., 1994. Some key features of Distributed Morphology. In: Carnie, A., Harley, H. (Eds.), MITWPL 21: Papers on Phonology and Morphology. MITWPL, Cambridge, pp. 275–288.
Harley, H., 2009. The morphology of nominalizations and the syntax of vP. In: Rathert, M., Giannakidou, A. (Eds.), Quantification, Definiteness, and Nominalization. Oxford University Press, Oxford, pp. 320–342.
Harley, H., 2013. External arguments and the Mirror Principle: on the distinctness of Voice and v. Lingua 125, 34–57.
Harley, H., 2014. On the identity of roots. Theor. Linguist. 40, 225–276.
Harley, H., Noyer, R., 2000. Formal versus encyclopedic properties of vocabulary: evidence from nominalisations. In: Peeters, B. (Ed.), The Lexicon-Encyclopedia Interface. Elsevier, Amsterdam, pp. 349–374.
Holmberg, A., Nikanne, U., Oraviita, I., Reime, H., Trosterud, T., 1993. The structure of INFL and the finite clause in Finnish. In: Holmberg, A., Nikanne, U. (Eds.), Case and Other Functional Categories in Finnish. Mouton de Gruyter, Berlin, pp. 177–206.
Julien, M., 2003. On the negated past in Finnic and Saami. In: Manninen, S., Nelson, D. (Eds.), Generative Approaches to Finnic and Saami Linguistics: Case, Features and Constraints. CSLI, Stanford, pp. 419–446.
Julien, M., 2013. Beginnings in North Sámi. Finno-Ugric Lang. Linguist. 2, 1.
Kåven, B., Jernsletten, J., Nordal, I., Eira, J.H., Solbakk, A., 1995. Sámi-dáru sátnegirji: samisk-norsk ordbok. Davvi Girji, Kárášjohka.
Korhonen, M., 1967. Die Konjugation im Lappischen. Morphologischhistorische Untersuchung. I. Die finiten Formkategorien. Suomalais-ugrilainen seura, Helsinki.
Kratzer, A., 1996. Severing the external argument from its verb. In: Rooryck, J., Zaring, L. (Eds.), Phrase Structure and the Lexicon. Kluwer, Dordrecht, pp. 109–137.
Marantz, A., 1995. ‘‘Cat’’ as a Phrasal Idiom: Consequences of Late Insertion in Distributed Morphology (Master’s thesis). MIT.
Marantz, A., 1997. No Escape From Syntax. University of Pennsylvania Working Papers in Linguistics 4:2, pp. 201–225.
McGinnis, M., 1995. Fission as feature-movement. In: Pensalfini, R., Ura, H. (Eds.), MITWPL 27: Papers on Minimalist Syntax. MIT Working Papers in Linguistics, Cambridge, pp. 165–187.
Merchant, J., 2015. How much context is enough? Two cases of span-conditioned stem allomorphy. Linguist. Inq. 46, 273–303.
Nickel, K.P., 1990. Samisk grammatikk. Universitetsforlaget, Oslo.
Nielsen, K., 1926. Lærebok i lappisk (samisk): utarbeidet på grunnlag av dialektene i Polmak, Karasjok og Kautokeino: grammatikk, tekster og glossar. Vol. 1: Grammatikk: lydlære, formlære, orddannelseslære og syntaks samt tillegg Brøgger, Oslo (reprinted 1979 by Universitets-forlaget, Oslo).
Nielsen, K., 1932–1962. Lappisk ordbok: grunnet på dialektene i Polmak, Karasjok og Kautokeino=Lapp dictionary: based on the dialects of Polmak, Karasjok and Kautokeino Aschehoug, Oslo (reprinted 1979 by Universitetsforlaget, Oslo).
Noyer, R., 1998. Impoverishment theory and morphosyntactic markedness. In: Lapointe, S., Brentari, D.K., Farrell, P. (Eds.), Morphology and Its Relation to Phonology and Syntax. CSLI, Stanford, pp. 264–285.
Oltra Massuet, M.I., 1999. On the Notion of Theme Vowel: A New Approach to Catalan Verbal Morphology (Master’s thesis). MIT.
Pylkkänen, L., 2002. Introducing Arguments (Doctoral dissertation). MIT.
Ramchand, G.C., 2008. Verb Meaning and the Lexicon: A First-Phase Syntax. Cambridge University Press, Cambridge.
Ramchand, G., Tungseth, M., 2006. Aspect and Verbal Prepositions. Tromsø Working Papers in Linguistics 33.2, Nordlyd, pp. 149–175.
Rothstein, S., 2004. Structuring Events. Blackwell, Oxford.
Sammallahti, P., 1998. The Saami Languages: An Introduction. Davvi Girji, Kárášjohka.
Sammallahti, P., 2002. North Saami Resource Dictionary. University of Oulu, Oulu.
Siddiqi, D., 2009. Syntax Within the Word. John Benjamins, Amsterdam.
Smith, C.S., 1991. The Parameter of Aspect. Kluwer, Dordrecht.
Son, M., Svenonius, P., 2008. Microparameters of cross-linguistic variation: directed motion and resultatives. In: Abner, N., Bishop, J. (Eds.), Proceedings of the 27th West Coast Conference on Formal Linguistics. Cascadilla Press, Somerville, pp. 388–396.
Svenonius, P., 2008. Paradigm generation and Northern Sami stems. In: Bachrach, A., Nevins, A. (Eds.), Inflectional Identity. Oxford University Press, Oxford, pp. 73–100.
Svenonius, P., 2012. Spanning (Master’s thesis). University of Tromsø.
Toivonen, I., 2003. Non-Projecting Words: A Case Study of Swedish Particles. Kluwer, Dordrecht.
Vendler, Z., 1957. Verbs and times. Philos. Rev. 66, 143–160.
Vinka, M., 2002. Causativization in North Sámi (Doctoral dissertation). McGill University.
Williams, E., 2003. Representation Theory. The MIT Press, Cambridge.
Young, R.W., Morgan Sr., W., 1987. The Navajo Language. University of New Mexico Press, Albuquerque.